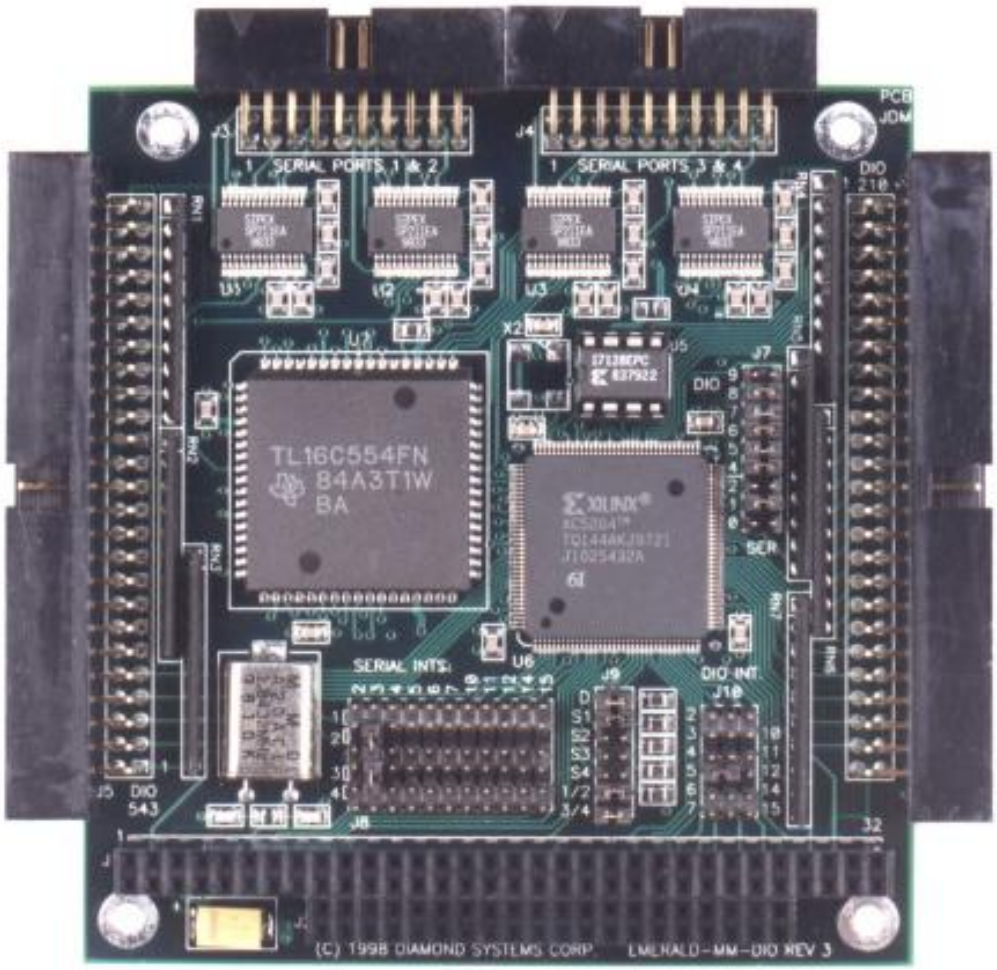
DIAMOND SYSTEMS CORPORATION

Emerald-MM-DIO-XT™

4 - Port RS-232 + 48 Digital I/O PC/104 Module



Features

- 4 RS-232 serial ports
- Flexible address and interrupt selection
- Full Interrupt Sharing Capability
- Interrupt status register for Windows NT
- Dual 20-pin I/O headers (2 ports per header) for serial ports
- 48 digital I/O lines
- Edge detection capability
- +5V only power supply
- Compatible with the WinSystems PCM-COM4 and PCM-UIO48A
- Two boards in one saves space and lowers cost

Description

For users who need a higher level of integration than our standard products deliver, we offer this two-in-one board with 4 RS-232 serial ports, 48 digital I/O lines, and extended temperature operation.

Each serial port provides the standard set of PC serial port signals. The ST16C554 quad UART chip on board contains a 16-byte FIFO for each port and supports data rates of up to 115kbps. Interrupt sharing is fully supported among the four serial ports, and an interrupt status register enables the board to operate under Windows NT. Eight different address combinations are possible, and any of 11 different interrupt levels can be used.

The 48 digital I/O lines feature programmable direction on a line by line basis, and all lines have 10KOhms pull-up resistors. One group of 24 lines includes the additional feature of programmable edge detection. Both active line selection and edge polarity are programmable. Status registers indicate which, if any, lines have changed logic levels in the selected manner since the last status check. An interrupt can be generated on the PC/104 bus whenever the indicated activity occurs.

Edge Detection Feature

The 24 digital I/O lines on ports 0 - 2 have edge detection capability. Active lines and edge polarity (rising or falling edges) are selectable line by line. When a selected line changes in the selected direction, a corresponding bit is set in an edge detection register. The 24 bits in these detection registers can be read and cleared by software. They are also funneled into an interrupt circuit, so that interrupts can be generated on the PC/104 bus when a change of state occurs.

Interrupt Status Register

The interrupt status register indicates the status of each port's interrupt request line. This register is required for proper operation under Windows NT. The status register will operate regardless of whether interrupt sharing is enabled. If two or more ports are sharing the same interrupt level, the status register will still indicate the correct status of each port's interrupt request line.

7	6	5	4	3	2	1	0
X	X	X	X	INT4	INT3	INT3	INT1

X	Bit not used; generally reads back as a 1
INT4-INT1	Status of interrupt request for each port: **0** no interrupt request active **1** interrupt request active

Interrupt Sharing

Each serial port requires an interrupt line for proper operation. Since there are a limited number of interrupts on the PC/104 bus, using multiple serial ports on a single computer can quickly become a problem. For this reason Emerald-MM-DIO fully supports interrupt sharing, using tristate bus drivers

and a status register to indicate the interrupt status of each port. Any number of ports or boards can share the same interrupt level.

I/O Header Pinout

Serial Ports

(Serial ports 1 and 2 shown; same pinout used for ports 3 and 4)

DCD 1	1	2	DSR 1
RXD 1	3	4	RTS 1
TXD 1	5	6	CTS 1
DTR 1	7	8	RI 1
GND	9	10	N/C
DCD 2	11	12	DSR 2
RXD 2	13	14	RTS 2
TXD 2	15	16	CTS 2
DTR 2	17	18	RI 2
GND	19	20	N/C

Digital I/O

Digital I/O (Digital I/O ports 0, 1, 2 shown; same pinout used for ports 3, 4 and 5).

Port 2 Bit 7	1	2	GND
Port 2 Bit 6	3	4	GND
Port 2 Bit 5	5	6	GND
Port 2 Bit 4	7	8	GND
Port 2 Bit 3	9	10	GND
Port 2 Bit 2	11	12	GND
Port 2 Bit 1	13	14	GND
Port 2 Bit 0	15	16	GND
Port 1 Bit 7	17	18	GND
Port 1 Bit 6	19	20	GND
Port 1 Bit 5	21	22	GND
Port 1 Bit 4	23	24	GND

Port 1 Bit 3	25	26	GND
Port 1 Bit 2	27	28	GND
Port 1 Bit 1	29	30	GND
Port 1 Bit 0	31	32	GND
Port 0 Bit 7	33	34	GND
Port 0 Bit 6	35	36	GND
Port 0 Bit 5	37	38	GND
Port 0 Bit 4	39	40	GND
Port 0 Bit 3	41	42	GND
Port 0 Bit 2	43	44	GND
Port 0 Bit 1	45	46	GND
Port 0 Bit 0	47	48	GND
+5V	49	50	

Specifications

Serial Ports

No. of serial ports	4, RS-232
Maximum baud rate	115kbps
Communications parameters	5, 6, 7, or 8 data bits; Even, odd, or no parity
Short circuit protection	All outputs protected against continuous short circuit
Input impedance	3KOhms min
Input voltage swing	±30V max
Output voltage swing	±5V min, ±7V typical

Digital I/O

No. of lines	48
Direction	Programmable bit by bit
Input voltage:	
- Logic 0	0.0V min, 0.8V max
- Logic 1	2.0V min, 5.0V max

Output voltage:	
Logic 0	0.0V min, 0.4V max
Logic 1	3.86V min, 5.0V max
Output current	±8mA max per line

General

I/O headers:	
- Serial ports	2 20-position (2x10) headers
- Digital I/O	2 50-pin (2x25) headers All I/O headers mate with standard ribbon cable (IDC) connectors
Dimensions	3.55" x 3.775" LxW (PC/104 standard)
Power supply	+5VDC ±5%
Current consumption	100mA typical, all outputs unloaded
Operating temperature	-40 to +85°C
Operating humidity	5% to 95% noncondensing
PC/104 bus	8 bit and 16-bit bus headers are installed (16-bit header is used for interrupt levels only)

Ordering Information

Emerald-MM-DIO-XT	4 RS-232 serial ports + 48 Digital I/O PC/104 Module ***Extended Temperature***

For More Information

Call 1 (800) 36-PC104 or (650) 813-1100 for more technical information on this product, for a free copy of our full-line catalog, or to place an order.

Download the Emerald-MM-DIO Manual - Adobe Acrobat format

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